

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1-18. (Canceled)

19. (New) A driving device for driving a movable member under position servo control by an ultrasonic actuator having characteristics that a moving speed of the movable member is varied substantially linearly by varying a non-frequency parameter, the device comprising:

a position detector which detects a present position of the movable member driven by the ultrasonic actuator;

a calculator which calculates a control target position of the movable member;

a driver which generates a drive signal to drive the ultrasonic actuator in a specified resonant state; and

a position servo controller which sets a basic driving frequency of the drive signal and controls said non-frequency parameter of the drive signal based on a difference between the present position and the control target position so that the movable member pursues the control target position.

20. (New) A driving device according to claim 19, wherein said non-frequency parameter is a voltage value of the drive signal.

21. (New) A driving device according to claim 19, wherein said non-frequency parameter is a duty cycle ratio of the drive signal.

22. (New) A driving device according to claim 19, wherein the adjustment of said non-frequency parameter is performed based on an adjustment value table.

23. (New) A driving device according to claim 22, wherein the adjustment value table is stored in advance.

24. (New) A driving device according to claim 19, further comprising a temperature detector which detects an ambient temperature, wherein the basic driving frequency is corrected depending on the ambient temperature.

25. (New) A driving device according to claim 19, wherein the ultrasonic actuator has driving frequency-speed characteristics that the speed is set at a substantially constant value in a predetermined frequency range.

26. (New) A driving device according to claim 25, wherein said non-frequency parameter is a voltage value of the drive signal

27. (New) A driving device according to claim 25, wherein said non-frequency parameter is a duty ratio of the drive signal.

28. (New) A driving device for driving a movable member under position servo control by an ultrasonic actuator having a resonant state in a constant amplitude state, the device comprising:

a position detector which detects a present position of the movable member driven by the ultrasonic actuator;

a calculator which calculates a control target position of the movable member;

a driver which generates a drive signal to drive the ultrasonic actuator in a specified resonant state; and

a position servo controller which sets a frequency of the drive signal to a frequency lower than a complete resonant frequency of the ultrasonic actuator, and which controls a first non-frequency parameter of the drive signal based on a difference between the present position and the control target position so that the movable member pursues the control target position.

29. (New) A driving device according to claim 28, wherein the ultrasonic actuator has characteristics that a moving speed of the movable member is varied substantially linearly by changing a second non-frequency parameter.

30. (New) A driving device according to claim 28, wherein the ultrasonic actuator has driving frequency-speed characteristics that the speed is set at a substantially constant value in a predetermined frequency range.

31. (New) A driving device according to claim 28, wherein the control target position is continuously changed.

32. (New) A driving device according to claim 28, wherein the calculator cyclically calculates the control target position at a predetermined cycle.

33. (New) A driving device according to claim 28, wherein said first non-frequency parameter is a voltage value of the drive signal or a duty ratio of the drive signal.

34. (New) A driving device for driving a movable member by an ultrasonic actuator under position servo control, the ultrasonic actuator being driven in a specified resonant state, and having characteristics that a moving speed of the movable member is varied substantially linearly by changing a non-frequency parameter, the device comprising:

a position detector which detects a present position of the movable member driven by the ultrasonic actuator;

a calculator which calculates a control target position of the movable member;

a driver which generates a drive signal to drive the ultrasonic actuator in the specified resonant state; and

a position servo controller which sets a basic driving frequency of the drive signal and controls said non-frequency parameter of the drive signal based on a difference between the present position and the control target position so that the movable member

pursues the control target position, wherein a frequency of the drive signal is maintained within a predetermined frequency range.

35. (New) A driving device according to claim 34, wherein the control target position is continuously changed.

36. (New) A driving device according to claim 34, wherein the calculator cyclically calculates the control target position at a predetermined cycle.

37. (New) A driving device according to claim 34, wherein the first non-frequency parameter is a voltage value of the drive signal or a duty ratio of the drive signal.

38. (New) A driving device for driving a movable member by an ultrasonic actuator under position servo control,

the ultrasonic actuator including:

an electro-mechanical conversion element which is expandable and contractible by application of a drive signal;

a supporting member which is fixed to an end of the electro-mechanical conversion element in an expanding/contracting direction thereof; and

a driving member which frictionally engages the movable member, and is fixed to the other end of the electro-mechanical conversion element in the expanding/contracting direction thereof, the supporting member and the movable member being movable relative to each other by expanding and contracting the electro-mechanical conversion element at a variable speed, the driving device comprising:

a position detector which detects a present position of the movable member driven by the ultrasonic actuator;

a calculator which calculates a control target position of the movable member;

a driver which generates the drive signal to drive the ultrasonic actuator in a specified resonant state; and

a position servo controller which sets a basic driving frequency of the drive signal and controls a non-frequency parameter of the drive signal based on a difference between the present position and the control target position so that the movable member pursues the control target position.

39. (New) A driving device according to claim 38, wherein the control target position is continuously changed.

40. (New) A driving device according to claim 38, wherein the calculator cyclically calculates the control target position at a predetermined cycle.

41. (New) A driving device according to claim 38, wherein said another parameter is a voltage value of the drive signal or a duty ratio of the drive signal.

42. (New) A camera provided with a movable member driven under position servo control, the movable member being provided in a photographing optical system, the camera comprising:

an ultrasonic actuator including:

an electro-mechanical conversion element which is expandable and contractible by application of a drive signal;

a supporting member which is fixed to an end of the electro-mechanical conversion element in an expanding/contracting direction thereof; and

a driving member which frictionally engages the movable member, and is fixed to the other end of the electro-mechanical conversion element in the expanding/contracting direction thereof, the supporting member and the movable member being movable relative to each other by expanding and contracting the electro-mechanical conversion element at a variable speed,

a position detector which detects a present position of the movable member driven by the ultrasonic actuator;

a calculator which calculates a control target position of the movable member;

a driver which generates the drive signal to drive the ultrasonic actuator in a specified resonant state; and

a position servo controller which sets a basic driving frequency of the drive signal and controls a non-frequency parameter of the drive signal based on a difference between the present position and the control target position so that the movable member pursues the control target position.

43. (New) A camera according to claim 42, wherein the movable member engages with a member for performing camera shake correction.